A design of experiment of DSLR image clarity: An experimental economic analysis

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Abstract

This research is focused on randomized designs, two-stage experiments that first randomize treatment of a group, then investigate on the significant factors with economic perspective. It is attempted to map the potential outcomes framework with partial interference to a regression model with clustered errors, calculate standard errors of randomized saturation designs. The objective of this study is to assess the clarity of a photographic image produced by a DSLR camera by varying relevant factors such as image distance, shutter speed, aperture etc with on impact financial support. The criterion for assigning the ranking was the ability of clearly seeing the object in the photographs and the sharpness of the object. Design of experiments (DOE)-based approach allows for an efficient estimation of the main effects and the interactions with minimal number of experiments. This study investigates the factors that are mostly responsible for DSLR image clarity. All the six factors are set in two levels to create a full-factorial 2^k design. A residual analysis has been done to test for defects such as non-normality, non-independent and non-constant variance. Based upon this evidence, we assert that (DOE)-based approach valuation information has the potential to negatively impact financial support for the exact resources the information is designed to promote and holds considerable potential for experimental economics, deserves greater attention as a methodological tool, and promises important insights on strategic decision making.

Key Words: Design of Experiment (DOE), Full Factorial Design, ANOVA, Economic and Statistical Analysis, Experimental Economics

Introduction and Literature Review

Although the economic valuation of the clarity of a photographic image produced by a DSLR camera is often relied upon to communicate the importance of ability of clearly seeing the object in the photographs and the sharpness of the object to policy makers and the public, the practice remains controversial. Our goal is to provide a bridge between the theoretical literature and the use of field experiments in economics to measure spillover effects. To this end, it is natural to impose a variance structure on potential outcomes that maps to the regression model typically used for power calculations when there is no interference The method for shape optimization used response surface design, a design of experiments (DOE) technique that is widely used for engineering problems (Feili, Ahmadian, & Rabiei Hosseinabad, 2014; Feili, Rabiei, Ahmadian, Karimi, & Majidi, 2016). The design set generation and optimal design analysis used the commercial statistical analysis program it is apparent that DOE is very necessary for the robust transit schedule problem since that DOE could examine the arbitrary transit system performance before it was put into the real operation.

The response variable was the clarity of the image. In conducting the experiment, we took photographs of your object varying the factors as per the design matrix. Thereafter different rating was assigned to the different photographs so obtained by the members of this group. The rating of the photographs was done on a scale of 1 – 16 with 16 being the highest ranked and 1 being the lowest. The object that was photographed during the course of the experiment was a bicycle helmet. The criteria for assigning the rating were the ability of clearly seeing the shape and detailing of the object. No two photographs were assigned similar ratings. Moreover, ratings in terms of fraction were not considered.

This study looks to study the effects of several factors that can be incorporated to growing grass from seed. Type of seed, use of fertilizer, use of water-retaining soil enhancement, frequency of watering, and quantity of water was studied to determine if any of these factors have a significant effect on the growth of grass seed. Although we find the possibility of crowding out compelling in the context of economic valuation, we assert that there may be an alternative explanation. We suggest that economic valuation may serve simply as a monetary prime, especially when the information is encountered by individuals unfamiliar with economic valuation of the non-market value of natural resources. If individuals are unaccustomed to processing such economic valuation information, the dollar values provided are likely to act primarily as monetary priming.

The following paragraph was taken from a recent study by Zaman et. al. (2018):
‘‘ANOVA test which is used on the univariate analysis of the results essentially handles the factors used in the experiment or the total of the square of the result variables in order to determine the contribution of their interactions on the experiment and determines the total variances. And then makes possible the election of the most suitable factor/parameter by calculating the contribution percentage of the change (Kim, & Yoon, 2017). The theory of single replicate incomplete factorial designs has been implemented and tested in certain literature to check what information it could provide regarding the interplay of optimization parameters. In literature only tables of low order incomplete factorial experiments are to be found (2^{k-p} and 3^{k-p}) and were used (Roy, 2001; Zhang, 2017). The most important process of the DOE is

determining the independent variable values at which a limited number of experiments will be conducted. For this purpose, Taguchi proposed an improved DOE. This approach adopts the fundamental idea of DOE, but simplifies and standardizes the factorial and fractional factorial designs so that the conducted experiments can produce more consistent results. The effect of the agriculture on environment is very important. Agricultural lands are mostly treated with chemical fertilizers. This causes heavy metal contamination in the soil. Numerous consumers are started to prefer to use organically produced food because of pesticide residues.’’

The following factors and levels were chosen for the experiment as choice of factor and levels.

Factor:

1. Distance (A)
2. Aperture opening (B)
3. Shutter speed (C)
4. Angle of View (D)
5. Location (E)
6. Flash Status (F)

Factor Range:

Factor	**High**	**Low**
A	20 feet	4 feet
B	Max	Min
C	Fast	Slow
D	Max	Min
E	Outdoor	Indoor

F	On	Off

Methodology

Choice of design

The different number of factors that were decided by the team in conducting the experiment was 6 with the use of economic valuation of natural resources. So our team was instructed to conduct a 2^6 full factorial design. We used design expert software to simulate the 2^6 full factorial design and collected data from clarity rating given by the team members.

A regression framework and a regression model to estimate treatment and spillover effects at each saturation in the support of an RS design (Π; f) is:

$$Y_{ic}^{obs} = \beta_0 + \sum_{p \in \Pi \setminus \{0\}} \beta_{1p} T_{ic} * \mathbb{1}\{P_c = p\} + \sum_{p \in \Pi \setminus \{0\}} \beta_{2p} S_{ic} * \mathbb{1}\{P_c = p\} + \varepsilon_{ic}$$

Statistical Analysis

The fundamentals of methodology in terms of statistical analysis in the current research has been taken from the research work by Rabiei Hosseinabad and Moraga (2017). To ensure that the gaps between the estimated data is not significant, a statistical validation test should be run (Rabiei Hosseinabad & Moraga, 2017; Hosseinabad E. R., Moraga R. J. 2017). Since real data contains outliers and do not follow normal distribution, a non-parametric test should be performed to investigate whether the gap between the graphs associated with real data and estimated data is significant which accurately has been implemented and tested by Rabiei Hosseinabad and Moraga (2017) and Rabiei and Ahmadian (2014).

Experimental Economic Matrix

Factorial designs are frequently used to identify the main effects as well as interactions amongst the various factors. For quantitative factors, the data can be represented through the commonly used "linear regression model."1 For two factors, it can be represented as:

$y = \beta_0 + \beta_1 x_1 + \beta_2 x_1 x_2 + \varepsilon$

where, β's are the regression coefficients. This first-order model can be generalized to a higher order model by addition of terms containing higher powers of x. In this study, six factors were utilized to set up the desgin of experiment (6 Factors: A, B, C, D, E, F). In general, method of least square is used to estimate $\hat{\beta}$ with the assumption that expected value and the variance of the error (ε) are E(ε) 50 and V(ε) = s 2 , respectively. In matrix notation, the model can be represented as:

$y = X\beta + \varepsilon$

where y, β, and ε are the column matrices of (n × 1), (p × 1), and (n × 1) vectors, respectively, X is a (n × p) matrix, and n is the number of observations. Further, p is the number of parameters in the model. The method chooses $\hat{\beta}$ so that the sum of squares of the error e is minimized. The least squares estimate of β is then given by

$\hat{\beta}$=(X ′X) -1X ′y And, the fitted regression model is $y = X\hat{\beta}$ (4) To evaluate the design and model statistically, it is necessary to estimate the variance (s 2).

No aliases found for 6FI model in the design matrix evaluation for factorial 6FI model. Aliases are calculated based on your response selection, taking into account missing datapoints, if necessary. Watch for aliases among terms you need to estimate.

Degrees of Freedom for Evaluation

Model	63
Residuals	0
Lack Of Fit	*0*
Pure Error	*0*
Corr Total	63

A recommendation is a minimum of 3 lack of fit df and 4 df for pure error. This ensures a valid lack of fit test. Fewer df will lead to a test that may not detect lack of fit.

The following table shows the design-matrix for full factorial design.

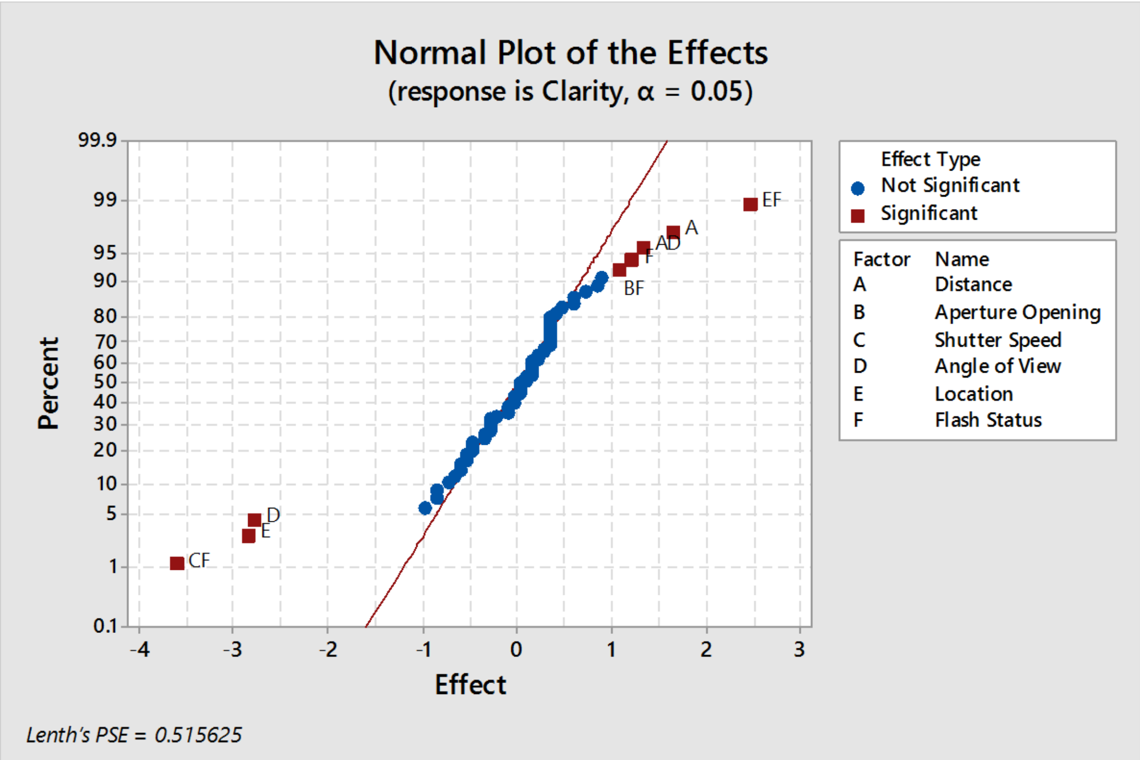
Design Matrix- Full Factorial Design (2^6)

Std	Run	Block	Factors						Response
			Distance	Aperture Opening	Shutter Speed	Angle of View	Location	Flash Status	Clarity
1	55	Block 1	4.00	Max	Fast	Max	Outdoor	On	12
2	32	Block 1	20.00	Max	Fast	Max	Outdoor	On	11
3	8	Block 1	4.00	Min	Fast	Max	Outdoor	On	14
4	20	Block 1	20.00	Min	Fast	Max	Outdoor	On	13

5	14	Block 1	4.00	Max	Slow	Max	Outdoor	On	14
6	58	Block 1	20.00	Max	Slow	Max	Outdoor	On	15
7	44	Block 1	4.00	Min	Slow	Max	Outdoor	On	12
8	53	Block 1	20.00	Min	Slow	Max	Outdoor	On	13
9	63	Block 1	4.00	Max	Fast	Min	Outdoor	On	06
10	35	Block 1	20.00	Max	Fast	Min	Outdoor	On	10
11	28	Block 1	4.00	Min	Fast	Min	Outdoor	On	07
12	47	Block 1	20.00	Min	Fast	Min	Outdoor	On	11
13	36	Block 1	4.00	Max	Slow	Min	Outdoor	On	09
14	40	Block 1	20.00	Max	Slow	Min	Outdoor	On	11
15	12	Block 1	4.00	Min	Slow	Min	Outdoor	On	07
16	30	Block 1	20.00	Min	Slow	Min	Outdoor	On	13
17	52	Block 1	4.00	Max	Fast	Max	Indoor	On	07
18	61	Block 1	20.00	Max	Fast	Max	Indoor	On	05
19	43	Block 1	4.00	Min	Fast	Max	Indoor	On	03
20	31	Block 1	20.00	Min	Fast	Max	Indoor	On	01
21	6	Block 1	4.00	Max	Slow	Max	Indoor	On	07
22	49	Block 1	20.00	Max	Slow	Max	Indoor	On	09
23	25	Block 1	4.00	Min	Slow	Max	Indoor	On	08
24	50	Block 1	20.00	Min	Slow	Max	Indoor	On	10
25	42	Block 1	4.00	Max	Fast	Min	Indoor	On	05
26	9	Block 1	20.00	Max	Fast	Min	Indoor	On	03
27	13	Block 1	4.00	Min	Fast	Min	Indoor	On	01
28	19	Block 1	20.00	Min	Fast	Min	Indoor	On	02
29	41	Block 1	4.00	Max	Slow	Min	Indoor	On	06
30	54	Block 1	20.00	Max	Slow	Min	Indoor	On	11
31	23	Block 1	4.00	Min	Slow	Min	Indoor	On	07
32	22	Block 1	20.00	Min	Slow	Min	Indoor	On	08
33	2	Block 1	4.00	Max	Fast	Max	Outdoor	Off	13
34	64	Block 1	20.00	Max	Fast	Max	Outdoor	Off	15
35	24	Block 1	4.00	Min	Fast	Max	Outdoor	Off	16
36	48	Block 1	20.00	Min	Fast	Max	Outdoor	Off	14
37	60	Block 1	4.00	Max	Slow	Max	Outdoor	Off	07
38	39	Block 1	20.00	Max	Slow	Max	Outdoor	Off	08
39	33	Block 1	4.00	Min	Slow	Max	Outdoor	Off	09
40	34	Block 1	20.00	Min	Slow	Max	Outdoor	Off	10
41	4	Block 1	4.00	Max	Fast	Min	Outdoor	Off	06
42	3	Block 1	20.00	Max	Fast	Min	Outdoor	Off	12
43	5	Block 1	4.00	Min	Fast	Min	Outdoor	Off	07
44	29	Block 1	20.00	Min	Fast	Min	Outdoor	Off	12
45	7	Block 1	4.00	Max	Slow	Min	Outdoor	Off	05
46	26	Block 1	20.00	Max	Slow	Min	Outdoor	Off	06
47	17	Block 1	4.00	Min	Slow	Min	Outdoor	Off	07
48	56	Block 1	20.00	Min	Slow	Min	Outdoor	Off	11
49	59	Block 1	4.00	Max	Fast	Max	Indoor	Off	13
50	27	Block 1	20.00	Max	Fast	Max	Indoor	Off	13
51	21	Block 1	4.00	Min	Fast	Max	Indoor	Off	14
52	46	Block 1	20.00	Min	Fast	Max	Indoor	Off	15

53	57	Block 1	4.00	Max	Slow	Max	Indoor	Off	07
54	38	Block 1	20.00	Max	Slow	Max	Indoor	Off	08
55	45	Block 1	4.00	Min	Slow	Max	Indoor	Off	09
56	10	Block 1	20.00	Min	Slow	Max	Indoor	Off	10
57	37	Block 1	4.00	Max	Fast	Min	Indoor	Off	08
58	18	Block 1	20.00	Max	Fast	Min	Indoor	Off	11
59	62	Block 1	4.00	Min	Fast	Min	Indoor	Off	07
60	51	Block 1	20.00	Min	Fast	Min	Indoor	Off	12
61	11	Block 1	4.00	Max	Slow	Min	Indoor	Off	05
62	1	Block 1	20.00	Max	Slow	Min	Indoor	Off	06
63	15	Block 1	4.00	Min	Slow	Min	Indoor	Off	06
64	16	Block 1	20.00	Min	Slow	Min	Indoor	Off	08

The following Figure shows the significant factors for the full factorial design. The following plot shows the normality plot of the response variable. The normality plot indicates the data follows normality since the p-value is less than 0.05. Knowing that the data follows normality, it enables us to utilize ANOVA analysis to determine the significant factors in the experiment.



The ANOVA for the reduced model is as follows:

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	8	673.00	84.125	27.94	0.000
Linear	4	320.81	80.203	26.64	0.000
Distance	1	43.89	43.891	14.58	0.000
Angle of View	1	123.77	123.766	41.10	0.000
Location	1	129.39	129.391	42.97	0.000
Flash Status	1	23.77	23.766	7.89	0.007
2-Way Interactions	4	352.19	88.047	29.24	0.000
Distance*Angle of View	1	28.89	28.891	9.59	0.003
Aperture Opening*Flash Status	1	19.14	19.141	6.36	0.015
Shutter Speed*Flash Status	1	206.64	206.641	68.63	0.000
Location*Flash Status	1	97.52	97.516	32.39	0.000
Error	55	165.61	3.011		
Total	63	838.61			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.73525	80.25%	77.38%	73.26%

Coded Coefficients

Term	Effect	Coef	SE Coef	T-Value	P-Value	VIF
Constant		9.078	0.217	41.85	0.000	
Distance	1.656	0.828	0.217	3.82	0.000	1.00
Angle of View	-2.781	-1.391	0.217	-6.41	0.000	1.00
Location	-2.844	-1.422	0.217	-6.56	0.000	1.00
Flash Status	1.219	0.609	0.217	2.81	0.007	1.00
Distance*Angle of View	1.344	0.672	0.217	3.10	0.003	1.00
Aperture Opening*Flash Status	1.094	0.547	0.217	2.52	0.015	1.00
Shutter Speed*Flash Status	-3.594	-1.797	0.217	-8.28	0.000	1.00
Location*Flash Status	2.469	1.234	0.217	5.69	0.000	1.00

Regression Equation in Coded Units

```
Clarity = 9.078 + 0.828 Distance - 1.391 Angle of View - 1.422 Location
+ 0.609 Flash Status
          + 0.672 Distance*Angle of View + 0.547 Aperture Opening*Flash Status
          - 1.797 Shutter Speed*Flash Status + 1.234 Location*Flash Status
```

Only factors A, D, E and interatctions AD, BF, EF and CF are significant.

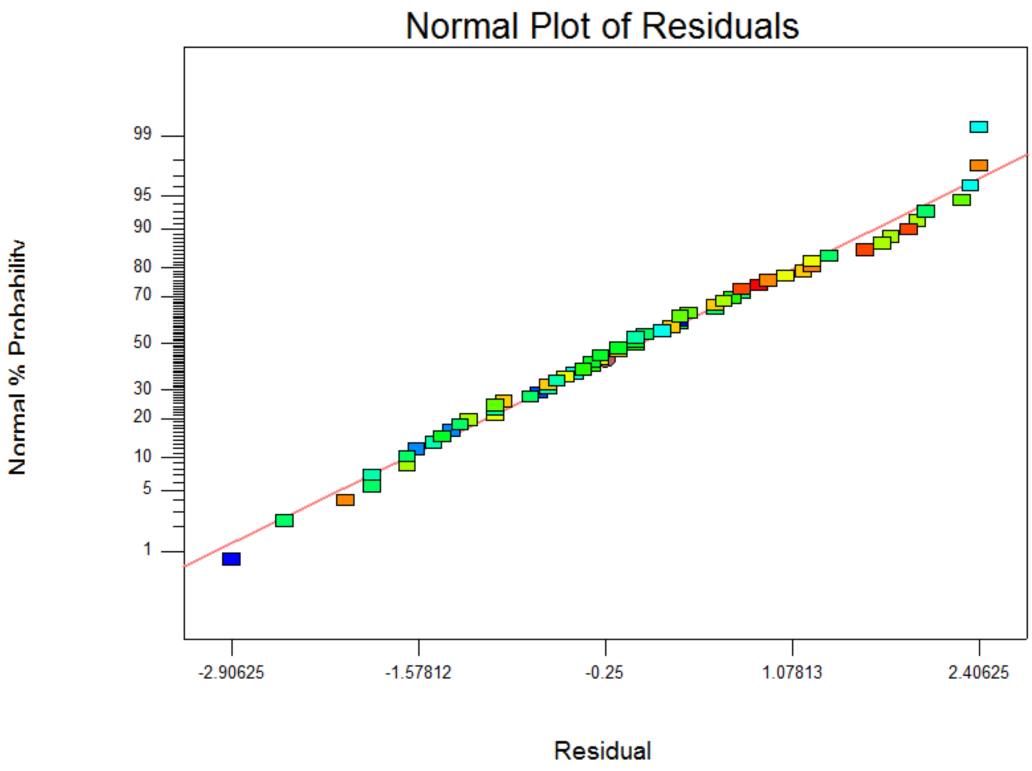
Economic and Statistical Analysis of DSLR Image Clarity

Also important to the interpretation of our findings is that despite the effect on donation behavior, exposure to the valuation information does not appear to alter attitudes toward the natural world. As measured by balance, were not different between the control ($P < 0.05$, $SD = 14.23$) and the treatment group ($P > 0.05$, $SD = 12.21$), $p = 0.45$, $d = -0.00098$. This suggests that although their attitudes toward the natural world were not altered, it is not economically effective on image clarity. This supports our hypothesis that the monetary value in the text is acting as a prime, rather than crowding out pro-environmental norms. If environmental normswere being replaced with market norms as a result of the treatment, we would have expected to see a lower score on our measure of ecological worldview within the treatment group. The true implications of our findings are uncertain also because there is no indication of how long the treatment effect lasts. In our study, the economic valuation informationwas introduced immediately prior to the donation ask, providing very little time delay between the monetary values and the pro-social behavior of interest (Goff, Waring, & Noblet, 2017).

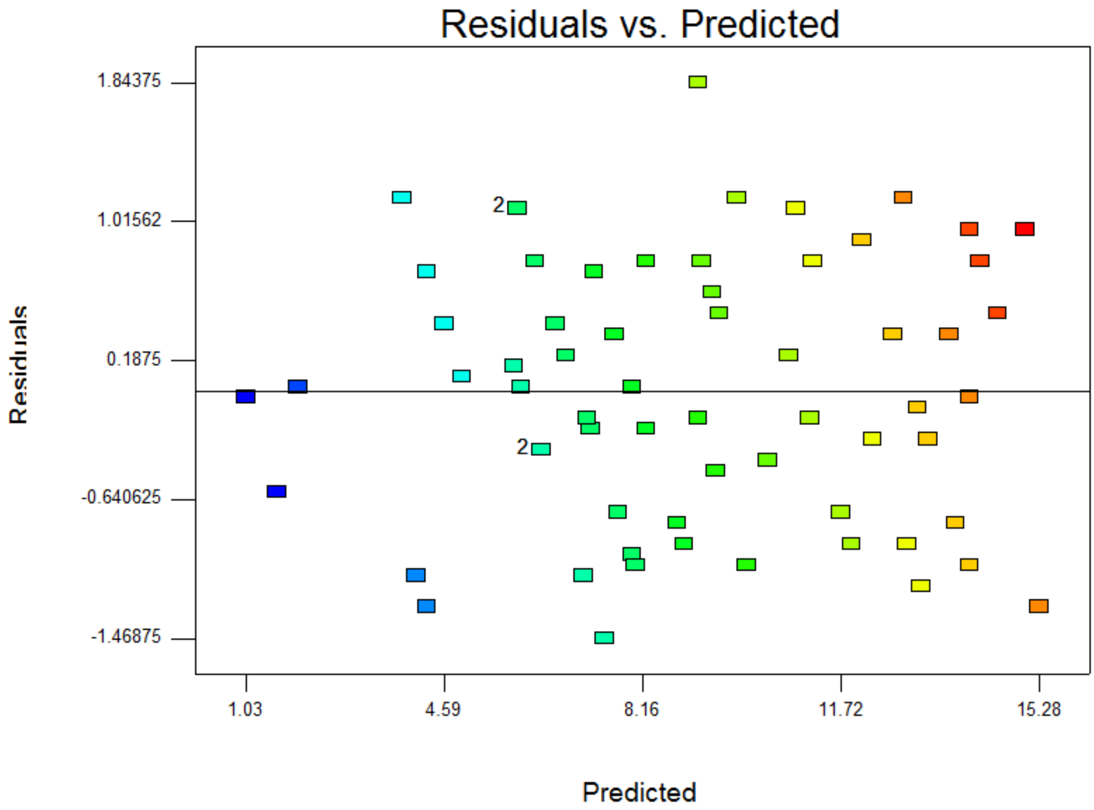
Model Adequacy Checking

As it is obvious from Normal Plot of Residuals, It follows normality for the most part and the number of outliers are not significant. Also, Residuals Vs. Predicted Plot reveals that we are relatively close to the actual values. Moreover, Residuals Vs. Run Plot shows the amount of variation that existed in the system which is in acceptable level. In general, the developed model is able to indicate the response variable and can be utilized in economic and statistical analysis.

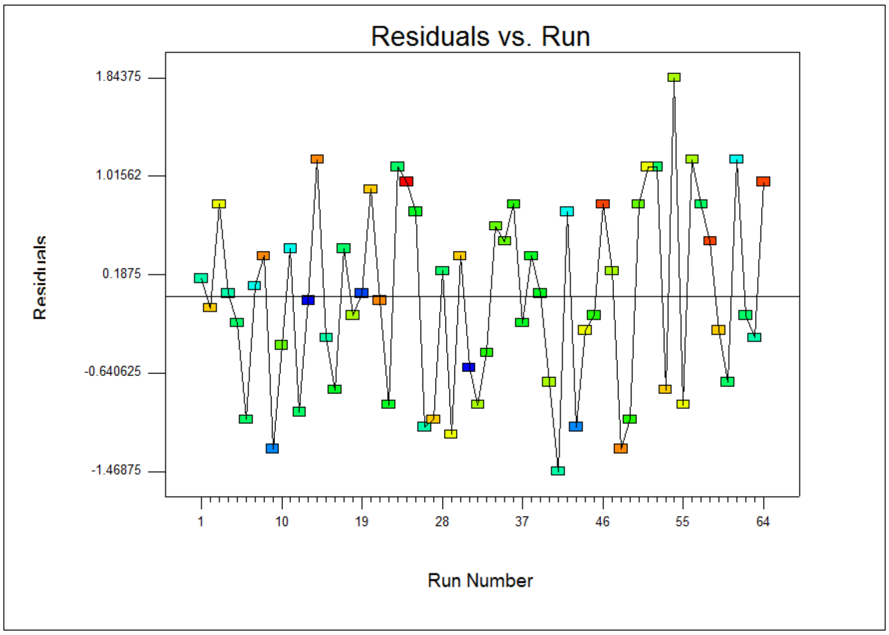
(i) Normal plot of residuals



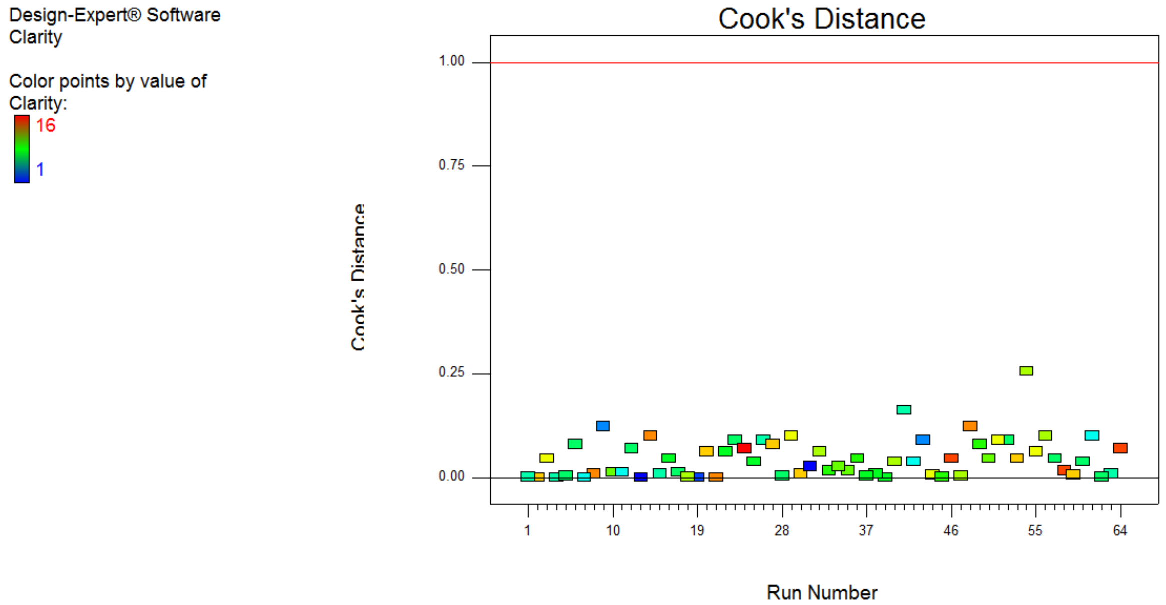
(ii) Residuals vs Predicted:



(iii) Residuals vs. Run



(iv) Cook's Distance



Economic Valuation Information of DOE

The findings of our study mirror the previously discussed work in economics which have shown that viewing dollar signs, calculating wages or handling money can cause individuals to become increasingly self-interested and less other-regarding. Participants' obligation to unknown others scores suggest that the valuation information in the treatment condition is sufficient to activate self-interest. Due to probabilistic equivalence and similarities across socio-demographic factors, there is no reason to believe there was any difference in moral obligation prior to study commencement (Goff, Waring, & Noblet, 2017). However, individuals reading the economic valuation text reported less obligation to engage in behaviors such as volunteering at a soup kitchen or volunteering in support of global social causes. These higher financial stress scores in the treatment group are coupled with lower scores on our index of feelings of obligation to others, demonstrating that the prime reduced other-regarding feelings and increased self-interest. We followed up the analysis of mean scores with a mediation analysis using scores on the obligation to unknown others scale as mediator between the treatment and subsequent donation amount. The analysis provides some support for partial mediation (11.5%), bias corrected bootstrap 90% CI for βindirect [−0.2268,−0.0044]. This suggests that self-interest activation plays at least a minor role in the effect of the treatment.

Results

The statistical analysis of the data clearly indicates the following interactions significantly affect the clarity of the photographic image.

- Factor A
- Factor D
- Factor E
- Factor AD interaction
- Factor BF interaction
- Factor EF interaction
- Factor CF interaction

The true implications of our findings are uncertain also because there is no indication of how long the treatment effect lasts. In our study, the economic valuation information was introduced immediately prior to the donation ask, providing very little time delay between the monetary values and the pro-social behavior of interest. In Controlling the interactions as required by the ANOVA analysis would result in better picture clarity and quality. In order to investigate reliability of our model, we have used the residual plot to see if they follows normality. As it is showed in the residual graph, almost all of them are plotted near the line proving this fact that residuals follows normality. Therefore, we can conclude that we were consistent in our analysis and our model is reliable.

Conclusion

The expectations of our research differed from that which might follow from standard economic theory in which price is thought to encode valuable information about an image clarity and the fact that what are the significant factors affecting that. In this experiment we have not used different types of cameras. So, in the future using different type of cameras one can perform the experiment. The selection of the cameras should also be randomized. If one is not able to manage different types of cameras, he/she should use a technique which would take care of this condition. This method is “SPLIT PLOTS”. These designs are especially used when it is not possible to completely randomize because of some reasons. This design would give more true results as compared to the present one. Also an individual holding the camera in his hand took the photographs. This could introduce certain nuisance variables, which may have affected our results. In the future, experiments may be conducted by keeping the camera on a steady surface, like using a tripod stand. In that way, more reliable results would have been obtained.

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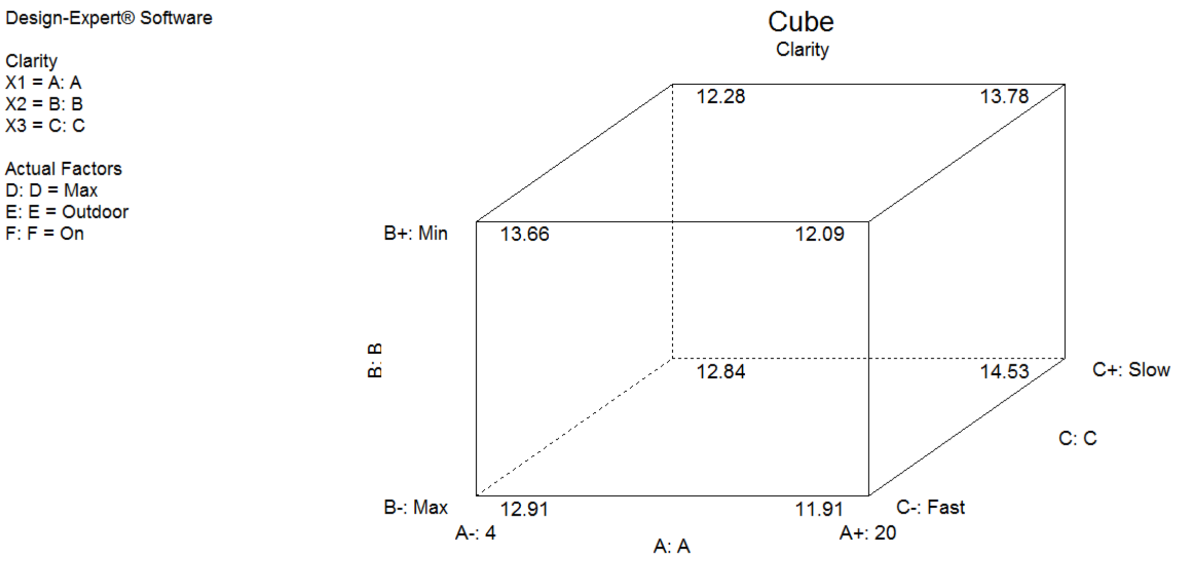
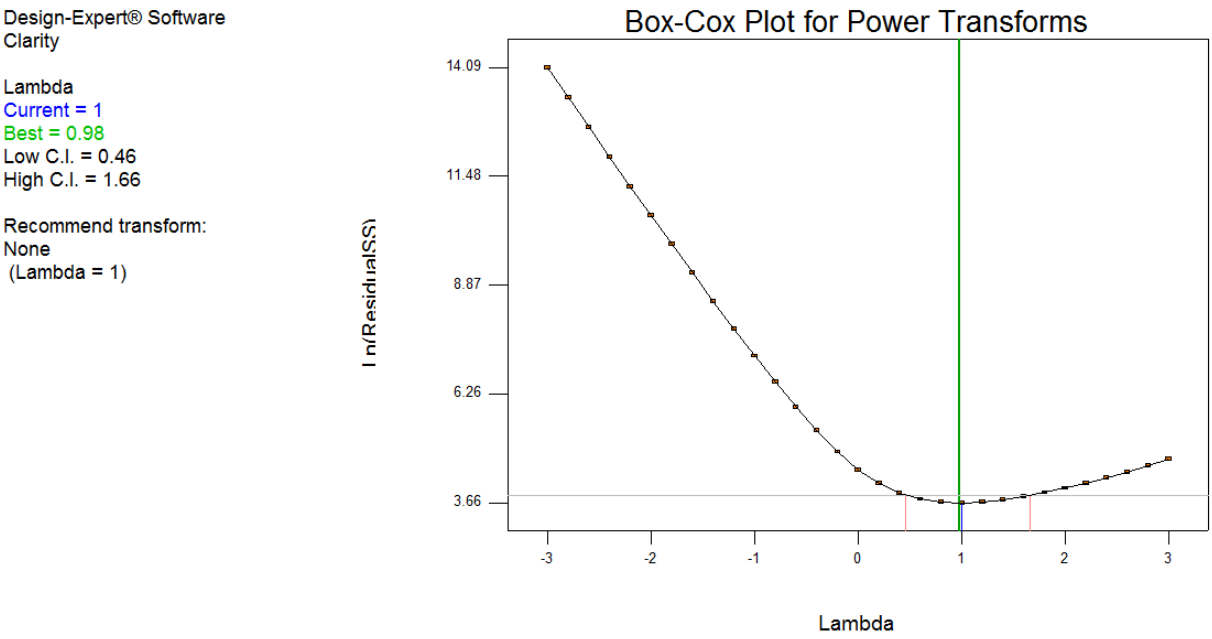
Appendix

(i) Cubic Plot:



(ii) Box Cox Plot



(iii) Diagnostic Case Statistics

Response 1 Clarity Transform: None

Diagnostics Case Statistics

Standard Order	Actual Value	Predicted Value	Residual	Leverage	Internally Studentized Residual	Externally Studentized Residual	Influence on Fitted Value DFFITS	Cook's Distance	Run Order
1	12.00	12.91	-0.91	0.656	-1.165	-1.175	-1.624	0.062	55
2	11.00	11.91	-0.91	0.656	-1.165	-1.175	-1.624	0.062	32
3	14.00	13.66	0.34	0.656	0.442	0.434	0.599	0.009	8
4	13.00	12.09	0.91	0.656	1.165	1.175	1.624	0.062	20
5	14.00	12.84	1.16	0.656	1.487	1.531	* 2.12	0.100	14
6	15.00	14.53	0.47	0.656	0.603	0.594	0.820	0.017	58
7	12.00	12.28	-0.28	0.656	-0.362	-0.354	-0.490	0.006	44
8	13.00	13.78	-0.78	0.656	-1.004	-1.005	-1.388	0.046	53
9	6.00	6.34	-0.34	0.656	-0.442	-0.434	-0.599	0.009	63
10	10.00	9.53	0.47	0.656	0.603	0.594	0.820	0.017	35
11	7.00	6.78	0.22	0.656	0.281	0.275	0.380	0.004	28
12	11.00	10.78	0.22	0.656	0.281	0.275	0.380	0.004	47
13	9.00	8.22	0.78	0.656	1.004	1.005	1.388	0.046	36
14	11.00	11.72	-0.72	0.656	-0.924	-0.921	-1.272	0.039	40
15	7.00	7.97	-0.97	0.656	-1.245	-1.262	-1.744	0.071	12
16	13.00	12.66	0.34	0.656	0.442	0.434	0.599	0.009	30
17	7.00	5.91	1.09	0.656	1.406	1.440	1.990	0.090	52
18	5.00	3.84	1.16	0.656	1.487	1.531	* 2.12	0.100	61
19	3.00	4.09	-1.09	0.656	-1.406	-1.440	-1.990	0.090	43
20	1.00	1.59	-0.59	0.656	-0.763	-0.756	-1.044	0.026	31
21	7.00	8.03	-1.03	0.656	-1.326	-1.350	-1.866	0.080	6
22	9.00	10.03	-1.03	0.656	-1.326	-1.350	-1.866	0.080	49
23	8.00	7.28	0.72	0.656	0.924	0.921	1.272	0.039	25
24	10.00	9.22	0.78	0.656	1.004	1.005	1.388	0.046	50
25	5.00	4.28	0.72	0.656	0.924	0.921	1.272	0.039	42
26	3.00	4.28	-1.28	0.656	-1.647	-1.719	* -2.37	0.123	9
27	1.00	1.03	-0.031	0.656	-0.040	-0.039	-0.054	0.000	13
28	2.00	1.97	0.031	0.656	0.040	0.039	0.054	0.000	19
29	6.00	7.47	-1.47	0.656	-1.888	-2.015	* -2.78	0.162	41
30	11.00	9.16	1.84	0.656	2.370	2.684	* 3.71	0.255	54
31	7.00	5.91	1.09	0.656	1.406	1.440	1.990	0.090	23
32	8.00	8.91	-0.91	0.656	-1.165	-1.175	-1.624	0.062	22
33	13.00	13.09	-0.094	0.656	-0.121	-0.118	-0.163	0.001	2
34	15.00	14.03	0.97	0.656	1.245	1.262	1.744	0.071	64
35	16.00	15.03	0.97	0.656	1.245	1.262	1.744	0.071	24
36	14.00	15.28	-1.28	0.656	-1.647	-1.719	* -2.37	0.123	48
37	7.00	7.72	-0.72	0.656	-0.924	-0.921	-1.272	0.039	60
38	8.00	7.97	0.031	0.656	0.040	0.039	0.054	0.000	39
39	9.00	9.47	-0.47	0.656	-0.603	-0.594	-0.820	0.017	33

40	10.00	9.41	0.59	0.6560.7630.756	1.044	0.026	34
41	6.00	5.97	0.031	0.6560.0400.039	0.054	0.000	4
42	12.00	11.22	0.78	0.6561.0041.005	1.388	0.046	3
43	7.00	7.22	-0.22	0.656-0.281-0.275	-0.380	0.004	5
44	12.00	13.16	-1.16	0.656-1.487-1.531	* -2.12	0.100	29
45	5.00	4.91	0.094	0.6560.1210.118	0.163	0.001	7
46	6.00	7.09	-1.09	0.656-1.406-1.440	-1.990	0.090	26
47	7.00	6.59	0.41	0.6560.5220.513	0.709	0.012	17
48	11.00	9.84	1.16	0.6561.4871.531	* 2.12	0.100	56
49	13.00	13.28	-0.28	0.656-0.362-0.354	-0.490	0.006	59
50	13.00	14.03	-1.03	0.656-1.326-1.350	-1.866	0.080	27
51	14.00	14.03	-0.031	0.656-0.040-0.039	-0.054	0.000	21
52	15.00	14.22	0.78	0.6561.0041.005	1.388	0.046	46
53	7.00	6.22	0.78	0.6561.0041.005	1.388	0.046	57
54	8.00	7.66	0.34	0.6560.4420.434	0.599	0.009	38
55	9.00	9.16	-0.16	0.656-0.201-0.196	-0.271	0.002	45
56	10.00	10.41	-0.41	0.656-0.522-0.513	-0.709	0.012	10
57	8.00	8.22	-0.22	0.656-0.281-0.275	-0.380	0.004	37
58	11.00	11.16	-0.16	0.656-0.201-0.196	-0.271	0.002	18
59	7.00	7.16	-0.16	0.656-0.201-0.196	-0.271	0.002	62
60	12.00	10.91	1.09	0.6561.4061.440	1.990	0.090	51
61	5.00	4.59	0.41	0.6560.5220.513	0.709	0.012	11
62	6.00	5.84	0.16	0.6560.2010.196	0.271	0.002	1
63	6.00	6.34	-0.34	0.656-0.442-0.434	-0.599	0.009	15
64	8.00	8.78	-0.78	0.656-1.004-1.005	-1.388	0.046	16

* Exceeds limits